



THE AIR UNIVERSITY



Think Tank Presentation
High Powered Microwave and UAV Integration for
A/A and A/G Operations

Capt Clarence Abercrombie, D-40



Overview



- The Threat
- Background
- COAs
 - UAV-Flying Missile (UAV-FM)
 - Enhanced UAV (E-UAV)
 - SPASSM
- Potential 2nd and 3rd Order Effects
- Constraining Factors
- The Best COA



The Threat

Russia Touts Drone Swarms and Electromagnetic Cannon for Sixth-Gen Fighter

TOPICS: [Air Force](#) [Global Hot Spots](#) [Russia](#) [Sixth-Generation Fighters](#)



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The Sukhoi T-50 is the prototype for Sukhoi PAK FA fifth-generation stealth fighter jet slated to enter service in the Russian Air Force in late 2016 or early 2017. (Getty Images)



Background

- UAV Swarming

The screenshot shows a Guinness World Records article. At the top, there's a navigation bar with links for PM, CARS, HOW TO, ADVENTURE, TECH, and FLIGHT. Below this is a search bar and a 'SEARCH' button. The main header features the Guinness World Records logo and the word 'AMAZING'. A dark blue bar contains the links 'EXPLORE RECORDS' and 'SET A RECORD'. The article title is 'Intel launches 500 drones into sky and breaks world record in spectacular style', written by Rachel Swatman and published on 04 November 2016. The main image shows a large number of drones flying in a fan shape against a dark sky. To the right, there's a 'Related Articles' section with two items: 'Intel stuns during CES keynote with record for most drones airborne simultaneously - watch incredible footage' and 'Nissan LEAF car used as a paintbrush to create largest glow-in-the-dark painting ever'. On the left side of the article, there's a partial view of another article titled 'Record Single'.

Record Single
50 certainly

Intel launches 500 drones into sky and breaks world record in spectacular style

By Rachel Swatman | Published 04 November 2016

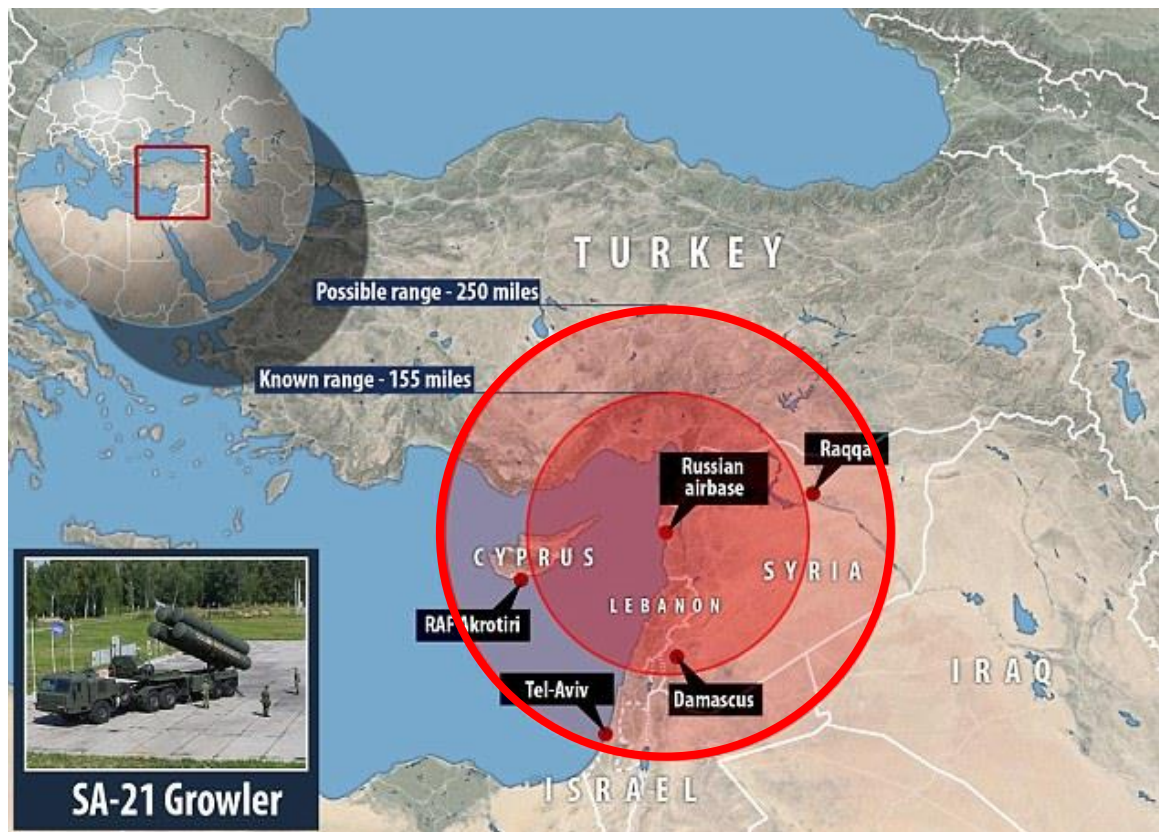
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Related Articles

- Intel stuns during CES keynote with record for most drones airborne simultaneously - watch incredible footage
- Nissan LEAF car used as a paintbrush to create largest glow-in-the-dark painting ever



Background





Background

- Counter-electronics High-powered Microwave Advance Missile Project (CHAMP)

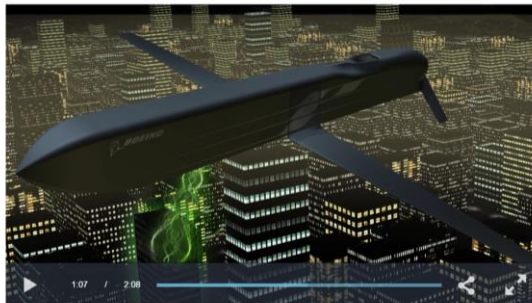


Commercial Defense Space Innovation 100 Global Our Principles

BOEING > FEATURES & MULTIMEDIA > DEFENSE > CHAMP - LIGHTS OUT

CHAMP - Lights Out

October 22, 2012 in Defense, Technology



A recent weapons flight test in the Utah desert may change future warfare after the missile successfully defeated electronic targets with little to no collateral damage.

Boeing and the U.S. Air Force Research Laboratory (AFRL) Directed Energy Directorate, Kirtland Air Force Base, N.M., successfully tested the Counter-electronics High-powered Microwave Advanced Missile Project (CHAMP) during a flight over the Utah Test and Training Range.

Next Story in Defense



First P-8A Poseidon Arrives in Australia

[View Story >](#)

More Stories in Defense



C-17 Scores A+ with Marines



The Rollout of the First Australian P-8A



The P-8A: From Fuselage to First Flight



Twice the Mettle



Boeing T-X Sees the Light



Catch and Release



Proposed COAs

- Development of UAV-Flying Missile (UAV-FM)
- Development of Enhanced UAV (E-UAV)
- Development of Self Protecting Air to Surface Stand-off Missile (SPASSM)



UAV-FM

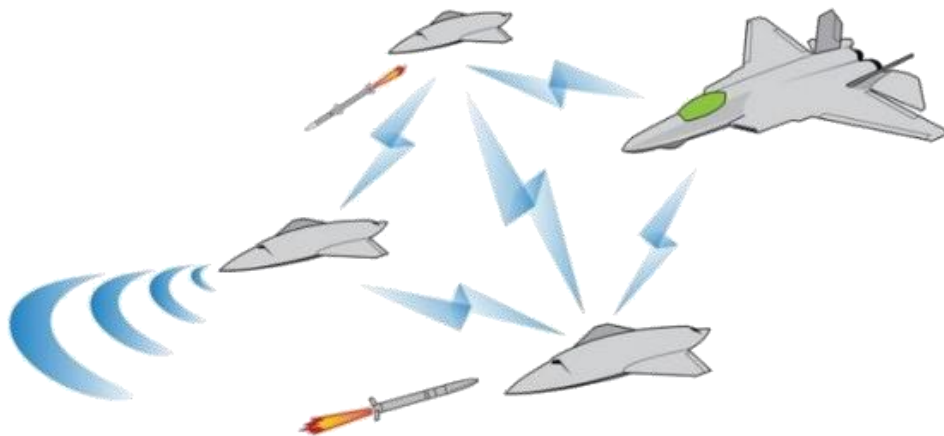
- UAV-FM
 - Cheap
 - Cost driven options
 - Kamikaze Capable (option 1)
 - Returnable wings (option 2)
 - Reusable
 - Assignment Hierarchy
 - Isolated Persons
 - Handheld device override





E-UAV

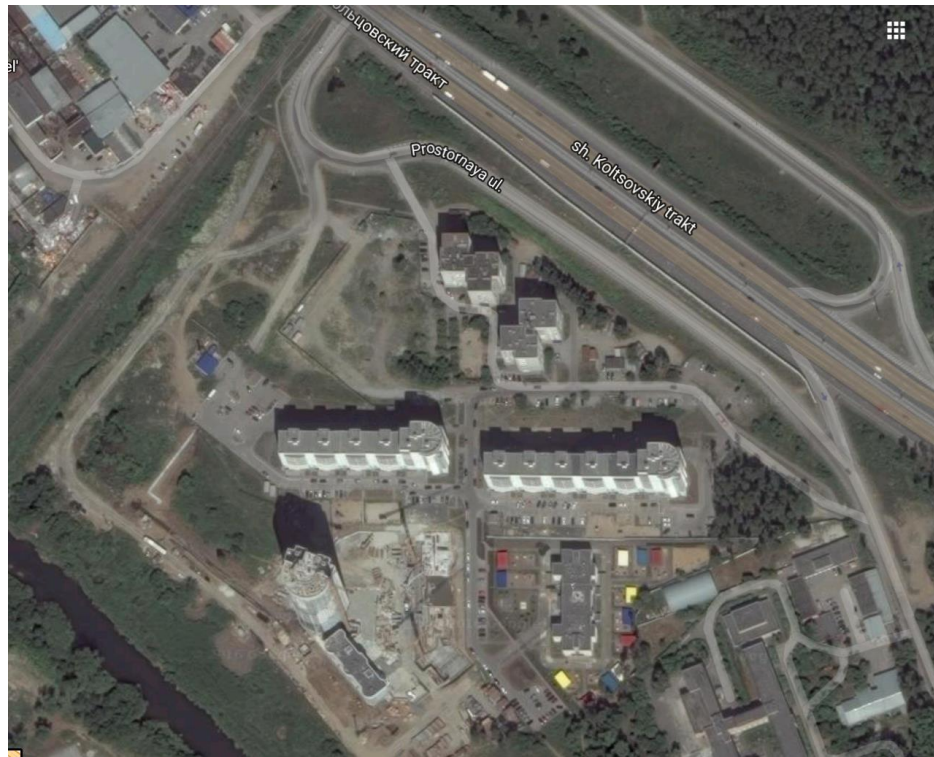
- E-UAV
 - Armed
 - Stealth
 - Loyal Wingman Logic
 - HPM Attack and Defense
 - HPM Protected
 - “Plug and Play” Parts





SPASSM

- SPASSM
 - JASSM Upgrade
 - Incorporate HPM
 - Circular Error of Probability logic
 - Median Azimuth Logic
 - Self- Destruct





2nd and 3rd Order Effects

2 nd Order Effects	3 rd Order Effects
Enemy will research ways to duplicate, defeat, and protect	Increases the need to protect ourselves from HPM
Increases military capability	Temporarily provides political leverage and deterrence
Desensitization to provoking actions due to UAV apathy	New doctrine will be developed to govern UAV use
Negative public reaction to near autonomous UAVs	Political Resistance
Slightly more maintainers and less operators	Lessens effect of fighter pilot shortage Less personnel funds = long term savings



Constraining Factors

- Initial Funding
- Political Resistance
- Laser Technology
- Indiscriminate



The Best COA

- Multi-targeting
- Technology already exists
- Short term and long term



Summary

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Questions?

